

Figure 1 is a block diagram of a system architecture. The system is connected to a central cloud labeled "Internet/Intranet, Any TCP/IP Based Network". This central network is connected to four main components: Client Application 101, Client Computer 102, Network Server 103A, and Network Server 103B. Client Application 101 and Client Computer 102 are shown as desktop computers. Network Server 103A and Network Server 103B are shown as server racks. Network Server 103A is connected to a group of components labeled "Data Processing System Components 112". This group includes Application Server 104A, Application Server 104B, Index Server 105A, Index Server 105B, and ODBC/JDBC Database Server(s) 110A, 110B. Application Server 104A is connected to Collection A Data 106A. Application Server 104B is connected to Collection B Data 106B. Index Server 105A is connected to Collection A Data 106A. Index Server 105B is connected to Collection B Data 106B. ODBC/JDBC Database Server(s) 110A, 110B are connected to both Application Server 104A and Application Server 104B. Network Server 103B is connected to a group of components including Application Server 104C, Application Server 104D, Index Server 105C, Index Server 105D, and ODBC/JDBC Database Server(s) 110C, 110D. Application Server 104C is connected to Collection C Data 106C. Application Server 104D is connected to Collection D Data 106D. Index Server 105C is connected to Collection C Data 106C. Index Server 105D is connected to Collection D Data 106D. ODBC/JDBC Database Server(s) 110C, 110D are connected to both Application Server 104C and Application Server 104D. A separate component, Network Server 103C, is also connected to the central network. It is connected to Authentication Server 108, ODBC/JDBC Database Server(s) 110C, and User Database 109. Authentication Server 108 is connected to ODBC/JDBC Database Server(s) 110C. ODBC/JDBC Database Server(s) 110C is connected to User Database 109. A horizontal line at the bottom of the diagram is labeled "TCP/IP Network 100".

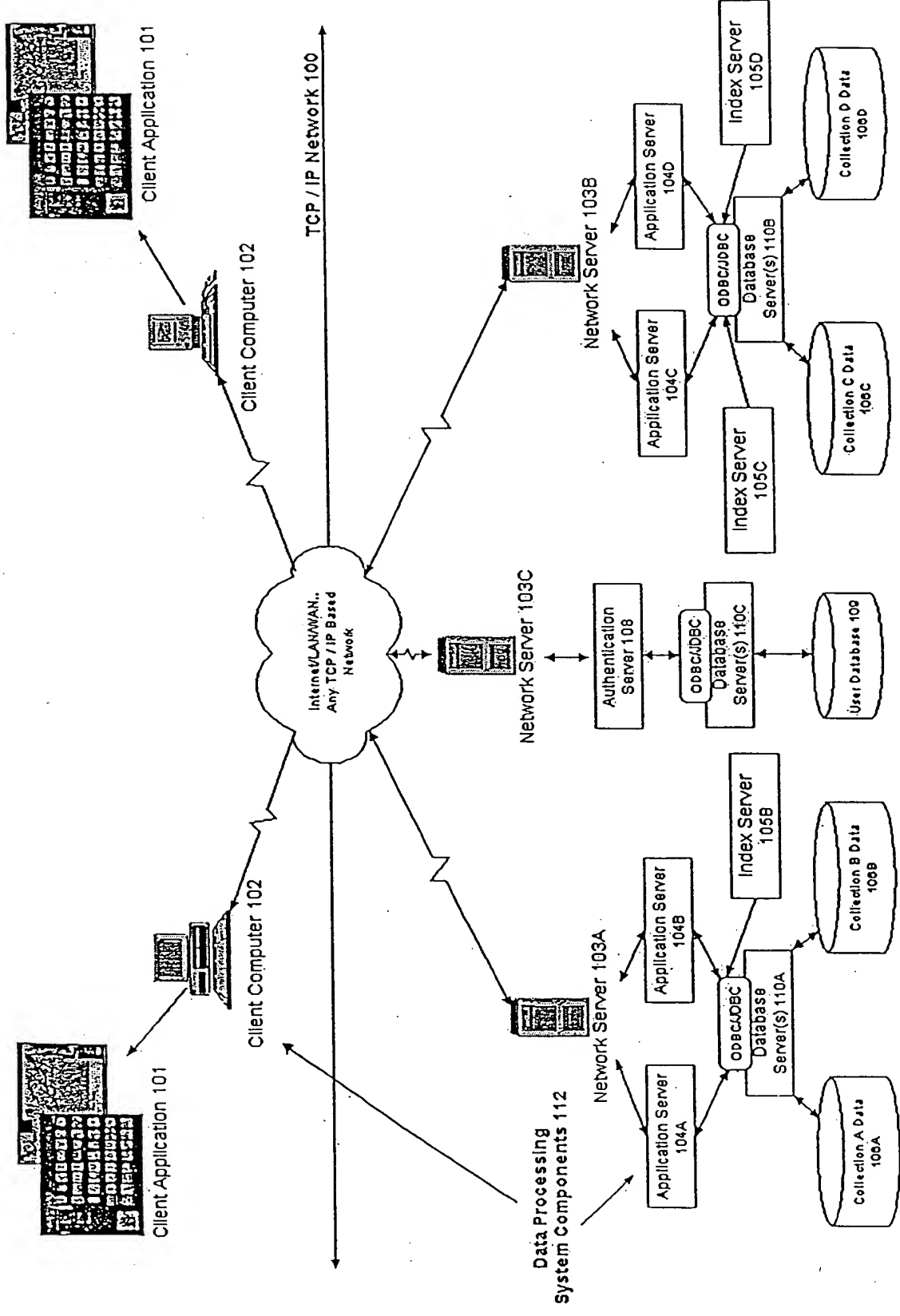


Figure 1

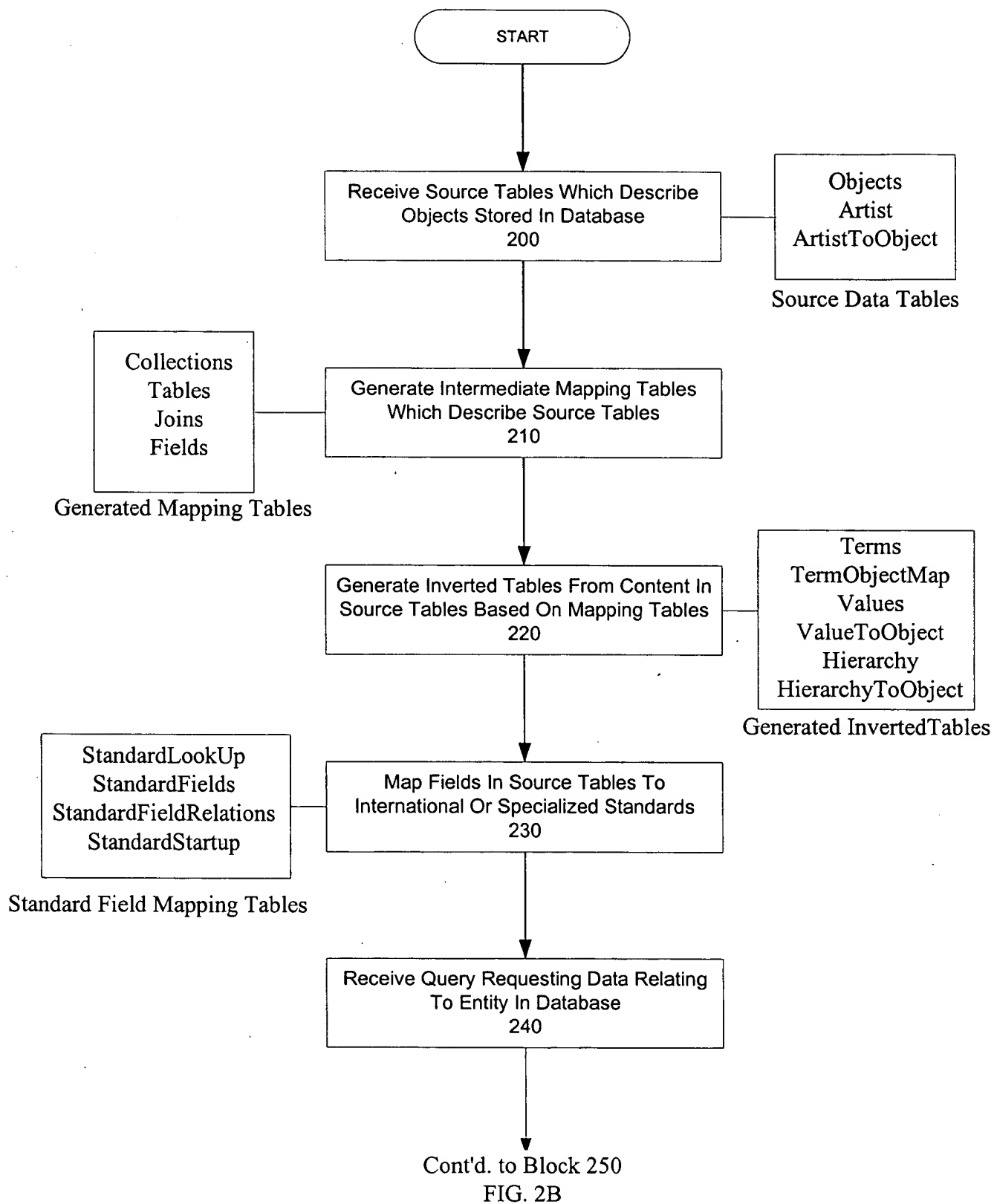


FIG. 2A

Cont'd. from Block 240

FIG. 2A

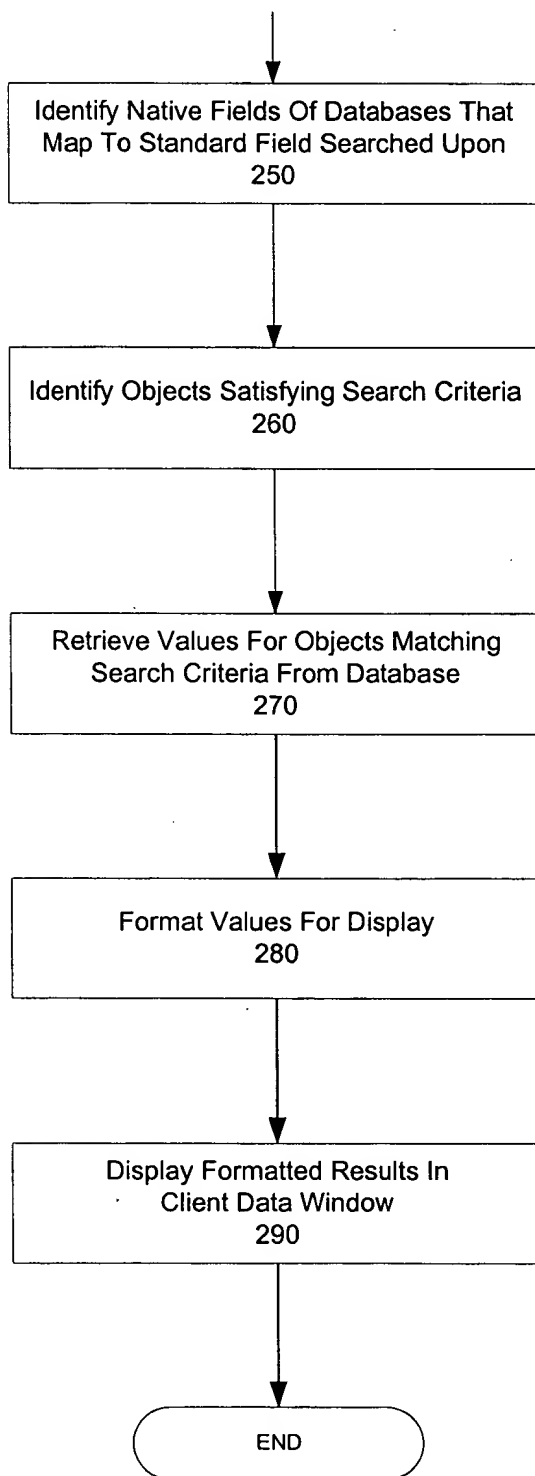


FIG. 2B

Objects Table

300

302

304

306

308

ObjectID	Title	Year	Status
1	Kleine Welten VII	1922	1
2	Parallel Diagonals	1923	1
3	Landscape with Church	1913	2
4	Mort d'Hamlet	1843	2
5	Arabes D'Oran	1833	1

Status Table

310

312

314

StatusID	Status
1	Restricted Use
2	Academic Use Only

FIG. 3

Artists Table

400

402

404

406

ArtistID	ArtistName	DateOfBirth
1	Kandinsky, Vasily	1866
2	Delacroix, Eugène	1798

ArtistsToObject Table

410

412

414

416

ArtistID	ObjectID	Preferred
1	1	Y
1	2	Y
1	3	Y
2	1	N
2	3	N
2	4	Y
2	5	Y

FIG. 4

Locations Table

500

502

504

LocationID	LocationName
1	U.S.
2	California
3	Nevada
4	San Francisco
5	Los Angeles
6	Reno
7	Las Vegas
8	Hawaii
9	Pacific Ocean

LocationParentChild Table

510

512

514

516

ParentID	ChildID	Preferred
1	2	Y
1	3	Y
1	8	N
2	4	Y
2	5	Y
3	6	Y
3	7	Y
9	8	Y

FIG. 5

	602	604	606	608	609
	EventID	LocationID	FromDate	ToDate	Description
	1	2	June 1880	June 1890	Exhibited...
Events Table	2	3	June 1890	June 1900	Exhibited...
600	3	4	June 1900	June 1910	Owned by...
	4	8	June 1910	June 1910	Owned by...

610	612
EventID	ObjectID
1	1
2	1
3	1
3	2
4	3
4	4
4	5

EventsObjects Table
610

	622	624	626
	PeopleID	Name	DOB
	1	Mullen, Margaret	1857
People Table	2	Karrer, Anthony	1865
620	3	Hauer, Bradford	1872

632	634
Person	Project
1	1
1	2
2	1
3	2

ProjectMember Table
630

	642	644
	ProjectID	Name
	1	Residence for Eugene Rayford
Projects Table	2	Marden Opera House Restoration
640		

652	654
ProjectID	ObjectID
1	1
1	2
1	5
2	3
2	4
2	5

ProjectsAndObjects Table
650

FIG. 6

ISCollections
Mapping Table
700

702

704

706

CollectionID	Name	OriginalDataSource
1	The Dalton Museum	DSN:c:\\asdf\\asdfa

ISTables
Mapping Table
710

712

714

716

717

718

TableID	CollectionID	TableName	Hierarchy	ParentChild
1	1	Objects	0	0
2	1	Projects	0	0
3	1	People	0	0
4	1	ProjectMember	0	0
5	1	ProjectToObject	0	0
6	1	Artists	0	0
7	1	ArtistToObject	0	0
8	1	Locations	1	1
9	1	Status	0	0
10	1	LocationParentChild	0	0
11	1	LocationFlattened	0	0
12	1	Events	0	0
13	1	EventToObject	0	0

FIG. 7

IRFields
Mapping Table
800

801	802	803	804	805	806
FieldID	FieldGroupID	Display Name	FieldType	FieldName	TableID
1	1	Title	1	Title	1
2	2	Year	2	Year	1
3	3	Status	1	Status	9
4	4	Project Member DOB	1	DateOfBirth	6
5	5	Project Name	1	Name	2
6	6	Artist Name	1	ArtistName	6
7	6	Artist Year of Birth	2	DateOfBirth	6
8	8	Location	1	LocationNam	8
9	8	Date	2	Date	12
10	8	Description	1	Description	12

Cont'd

807	808	809	810
Display Order	DataField Searchable	Keyword Searchable	Displayed In Data
1	1	1	1
2	1	1	1
3	1	1	1
4	1	1	1
5	1	1	1
6	1	1	1
7	1	1	1
8	1	1	1
9	1	1	1
10	0	1	1

FIG. 8

IRFieldGroups
Mapping Table
820

822	824	826	828	829
FieldGroupID	CollectionID	DisplayName	FieldType	JoinPath
1	1	Title	1	0
2	1	Year	1	0
3	1	Status	1	10
4	1	Project Member	1	1
5	1	Project Name	1	3
6	1	Artist	2	5
8	1	Events	2	7

IS Joins
Mapping Table
900

902	904	906	907	908	909
JoinID	StartTableID	StartFieldName	EndTableID	EndFieldName	NextJoin
1	3	PeopleID	4	Person	2
2	4	Project	2	ProjectID	3
3	2	ProjectID	5	ProjectID	4
4	5	ObjectID	1	ObjectID	0
5	6	AristID	7	ArtistID	6
6	7	ObjectID	1	ObjectID	0
7	8	LocationID	12	LocationID	8
8	12	LocationID	13	LocationID	9
9	13	ObjectID	1	ObjectID	0
10	9	StatusID	1	Status	0

FIG. 9

Composite of ISTables, IRFields, and IRFieldGroups
1000

1002	1004	1006	1007	1008	1009
FieldGroup	DisplayName	FieldID	FieldName	TableName	JoinPath
1	Title	1	Title	Objects	0
2	Year	2	Year	Objects	0
3	Status	3	Status	Status	10
4	Project Member DOB	4	YearOfBirth	Artists	1
5	Project Name	5	Name	Projects	3
6	Artist	6	ArtistName	Artists	5
6	Artist	7	YearOfBirth	Artists	5
8	Events	8	LocationName	Locations	7
8	Events	9	Date	Events	7
8	Events	10	Description	Events	7

FIG. 10

ISJoins Table Joined With ISTables Table

1100

1102	1104	1106	1107	1108	1109
JoinID	TableName	StartFieldName	Tables_1.TableName	EndFieldName	NextJoin
1	People	PeopleID	ProjectMember	Person	2
2	ProjectMember	Project	Projects	ProjectID	3
3	Projects	ProjectID	ProjectToObject	ProjectID	4
4	ProjectToObject	ObjectID	Objects	ObjectID	0
5	Artists	AristID	ArtistToObject	ArtistID	6
6	ArtistToObject	ObjectID	Objects	ObjectID	0
7	Locations	LocationID	Events	LocationID	8
8	Events	LocationID	EventToObject	LocationID	9
9	EventToObject	ObjectID	Objects	ObjectID	0
10	Status	StatusID	Objects	Status	0

1112

1114

1116

ArtistName	YearOfBirth	ObjectID
Kandinsky, Vasily	1866	1
Delacroix, Eugène	1798	1
Kandinsky, Vasily	1866	2
Kandinsky, Vasily	1866	3
Delacroix, Eugène	1798	3
Delacroix, Eugène	1798	4
Delacroix, Eugène	1798	5

Result Table From Second Join Example

1110

1132

1134

ObjectID	Name
1	Mullen, Margaret
2	Mullen, Margaret
5	Mullen, Margaret
1	Karrer, Anthony
2	Karrer, Anthony
5	Karrer, Anthony
3	Mullen, Margaret
4	Mullen, Margaret
5	Mullen, Margaret
3	Hauer, Bradford
4	Hauer, Bradford
5	Hauer, Bradford

1142

1144

1146

1148

LocationName	Date	Description	ObjectID
California	June 1880	Exhibited...	1
Nevada	June 1890	Exhibited...	1
San Francisco	June 1900	Owned by...	1
San Francisco	June 1900	Owned by...	2
Hawaii	June 1910	Owned by...	3
Hawaii	June 1910	Owned by...	4

Result Table From Fourth Join Example

1140

Result Table From Third Join Example

Involving Four Join Operations

1130

FIG. 11

1202	1204	1206
ArtistName	YearOfBirth	ObjectID
Kandinsky, Vasily	1866	1
Delacroix, Eugène	1798	1
Kandinsky, Vasily	1866	2
Kandinsky, Vasily	1866	3
Delacroix, Eugène	1798	3
Delacroix, Eugène	1798	4
Delacroix, Eugène	1798	5

Example Source Table
1200

1212	1214	1216
TermID	Keyword	RefCount
1	kandinsky	1

DTTerms Table
("kandinsky")
1210

1222	1224	1226
TermID	ObjectID	FieldID
1	1	6

DTTermObjectMapTable
("kandinsky")
1220

1232	1234	1236
TermID	Keyword	RefCount
1	kandinsky	1
2	vasilly	1

DTTerms Table
("kandinsky" and "vasilly")
1230

1242	1244	1246
TermID	ObjectID	FieldID
1	1	6
2	1	6

DTTermObjectMap Table
("kandinsky" and "vasilly")
1240

1252	1254	1256
TermID	Term	RefCount
1	kandinsky	1
2	vasilly	1
3	delacroix	1
4	eugene	1

DTTerms Table
(for all terms in source table)
1250

1262	1264	1266
TermID	ObjectID	FieldID
1	1	6
2	1	6
3	1	6
4	1	6

DTTermObjectMap Table
(for all terms in source table)
1260

FIG. 12

1302	1304	1306
TermID	Term	RefCount
1	kandinsky	2
2	vasilly	1
3	delacroix	1
4	Eugene	1

DTTerms Table
 (for all terms in source table
 increase reference count)
 1300

1312	1314	1316
TermID	ObjectID	FieldID
1	1	6
2	1	6
3	1	6
1	2	6

DTTermObjectMap Table
 (for all terms in source table
 term associated with two objects)
 1310

1322
Term
a
the
an
of

ISStopList Table
 1320

FIG. 13

1402	1404	1406	1408
ValueID	ValueText	FieldID	RefCount
1	Kandinsky, Vasily	6	1
2	1866	7	1
3	Delacroix, Eugène	6	1
4	1798	7	1

DTValueText Table
1400

1412	1414	1416	1418	1419
ValueID	ObjectID	DisplayOrder	Grouping	Preferred
1	1	0	0	1
2	1	0	0	1
3	1	0	0	1
4	1	0	0	1

DTValueText ObjectMapTable
1410

1422	1424	1426	1428	1429
ValueID	ValueText	ValueNumber	FieldID	RefCount
1	Kandinsky, Vasily		6	1
3	Delacroix, Eugène		6	1

DTValueText Table
1420

1432	1434	1436	1438	1439
ValueID	ValueText	ValueNumber	FieldID	RefCount
2		1866	7	1
4		1798	7	1

DTValueNumber Table
1430

FIG. 14

1502	1504	1506	1507	1508	1509
StandardID	Standard_Type	StandardName	Version	Standards_Order	Enabled
0	3	CDWA	1.0	5	0
3	3	VRA	2.0	3	1
4	3	VRA v3.0	3.0	4	1
8	1	HFJ Museum	1.0	0	1

SLStandardsLookup Table 1500

1511	1512	1513	1514	1515
StandardID	StandardName	StandardFieldID	StandardFieldName	StandardFieldDisplayName
8	HFJ Museum	1	Artist	Artist
8	HFJ Museum	2	Artist_Dates	Artist Dates
8	HFJ Museum	3	Nationality	Nationality

cont.

1516	1517	1518	1519
StandardFieldType	LongString	StandardFieldDisplayOrder	StandardPickedField
1	2	1	1
1	2	2	0
1	2	3	0

SLStandardFields Table 1510

1522	1524	1526	1528	1529
StandardID	StandardName	StandardFieldID	MappingStandardName	MappingStandardFieldID
8	HFJ Museum	1	CDWA	102
8	HFJ Museum	2	CDWA	104
8	HFJ Museum	3	CDWA	111

SLFieldStandardRelation Table 1520

1531	1532	1533	1534	1535
StandardID	StandardName	CreateThumbCache	Thumbnail1FieldID	Thumbnail2FieldID
3	VRA	1	2	6
4	VRA v3.0	0	3	16

contd.

1536	1537	1538	1539	1540	1541
Thumbnail3FieldID	Thumbnail4FieldID	Sort1FieldID	Sort2FieldID	Sort4FieldID	Sort4FieldID
7	14	14			
21	40	40			

SLStandardStartup Table 1530

FIG. 15

1602

1604

Keyword	ObjectID
kandinsky	1
kandinsky	2
kandinsky	3

Result Table
(Terms Search)
1600

1612

1614

Value	ObjectID
Kandinsky, Vasily	1
Kandinsky, Vasily	2
Kandinsky, Vasily	3

Result Table
(Values Search)
1610

1622

1624

1626

1628

1629

FieldGroupID	FieldType	DisplayName	FieldID	Display Name
1	1	Title	1	Title
2	1	Year	2	Year
3	1	Status	3	Status
4	1	Project Member	4	Project Member
5	1	Project Name	5	Project Name
6	2	Artist	6	Artist Name
6	2	Artist	7	Artist Year of
8	2	Events	8	Location
8	2	Events	9	Date
8	2	Events	10	Description

Field and FieldGroup Table

1620

1632

1634

1636

1638

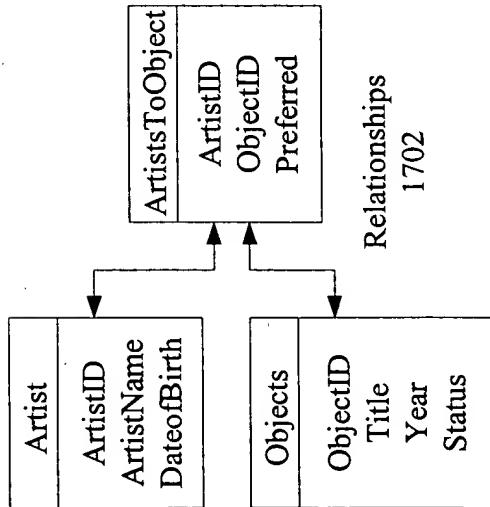
1639

FieldID	Grouping	Display Name	Value	ObjectID
1	1	Title	Kleine Welten VII	1
2	1	Year	1922	1
3	1	Status	Restricted Use	1
4	1	Project	Karrer, Anthony	1
4	2	Project	Mullen, Margaret	1
5	1	Project	Residence for Eugene	1
6	1	Artist Name	Kandinsky, Vasily	1
6	2	Artist Name	Delacroix, Eugène	1
7	1	Year Of Birth	1866	1
7	2	Year Of Birth	1798	1

Value Table

1630

FIG. 16



Artist (400)

ArtistID	ArtistName	DateOfBirth
1	Kandinsky, Vasily	1922
2	Delacroix, Eugene	1923

ArtistToObject (410)

ArtistID	ObjectID	Preferred
1	1	1
1	2	1
2	1	0

Source Tables
1700

Intermediate Mapping Tables
1710

Tables (710)

TableID	CollectionID	TableName	Hierarchy	ParentChild
1	1	Objects	0	0
2	1	Artists	0	0
3	1	ArtistToObject	0	0

Joins (900)

JoinID	StartTable	StartFieldName	EndTable
1	Artist	ArtistID	ArtistToObject
2	ArtistToObject	ArtistToObject	Objects

Joins (900) contd...

EndFieldName	NextJoin
ArtistID	2
ObjectID	0

Fields (800)

FieldID	DisplayName	FieldName	FieldType
6	ArtistName	ArtistName	String
7	DateofBirth	DateofBirth	Number

Fields (800) contd...

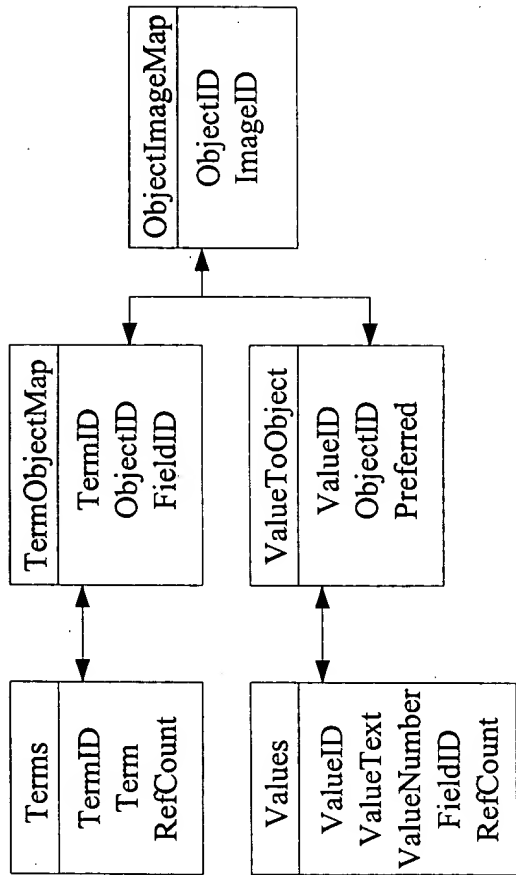
Table	NextJoin
Artists	1
Artists	1

Results of Constructed SQL Query (1712)

ArtistName	YearofBirth	ObjectID
Kandinsky, Vasily	1866	1
Delacroix, Eugene	1798	1
Kandinsky, Vasily	1866	2

FIG. 17A

FIG. 17B



Relationships
1722

Terms (1300)

TermID	Term	RefCount
1	Kandinsky	2
2	Vasily	2
3	Delacroix	1
4	Eugene	1
5	1866	1
6	1798	1

TermObjectMap (1310)

TermID	ObjectID	FieldID
1	1	6
2	1	6
3	1	6
4	1	6
1	2	6
2	2	6

Values (1420, 1430)

ValueID	ValueText	ValueNumber	FieldID	RefCount	Enabled
1	Kandinsky, Vasily		6	2	1
2		1866	7	2	1
3	Delacroix, Eugene		6	1	1
4		1798	7	1	1

ValueToObject (1410)

ValueID	ObjectID	Preferred
1	1	1
2	1	1
3	1	0
4	1	0
1	2	1
2	2	1